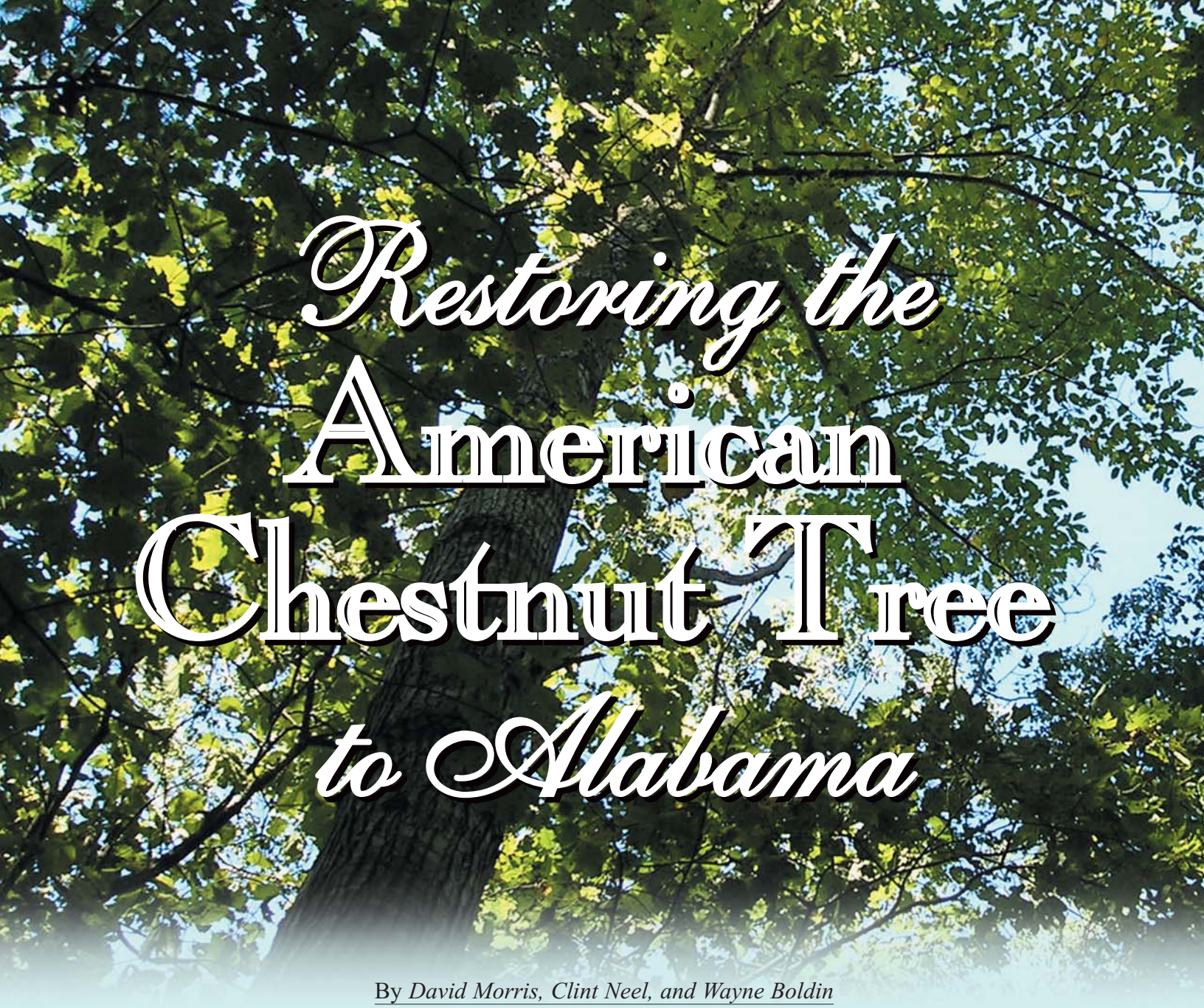

Restoring the American Chestnut Tree to Alabama

By *David Morris, Clint Neel, and Wayne Boldin*

"We lived next to a big forest and there were giant American chestnut trees growing there. We'd walk to our little school, Clear Creek School, that went through the sixth grade, and we had a young teacher at the time that would take a group of us to the forest to collect the nuts after they'd fallen. We brought cloth bags from home made from feed and guano sacks especially for gathering the chestnuts. The largest trees were about 100 feet tall, and when the burs would fall off the tree, they'd crack open because they fell from such a great height. When those burs had fallen, we'd have to be careful about stepping on them because they were so sharp. I remember my father saying how he could split one hundred rails because the chestnut wood was so easy to use. We weren't too aware of the blight when it first happened since I was away at college; while we were aware the trees were dying we didn't realize the importance of the blight at the time. I hope The American Chestnut Foundation can bring the tree back." *– Julius Brasher, age 91, Brasher Springs, Etowah County*

The American chestnut, known as the "King of the Forest," once accounted for nearly 25% of hardwood trees growing in forests reaching from Alabama up to Maine, and west across the Ohio valley. The trees grew straight and tall, sometimes stretching 80-100 feet skyward. Nuts from the tree fed man and beast alike, and families throughout the Appalachian Mountains sold the nuts as a cash crop to vendors in major cities including New York and Philadelphia at Christmastime. Wood from the trees was strong, flexible, and rot resistant – good for building homes, furniture, and barns. In short, the American chestnut was one of the most important trees to Americans

Photo by Arthur Hitt

living in the United States at the turn of the 20th century.

Today, the American chestnut no longer achieves the height nor the grandeur of its ancestors. By 1954, approximately four billion American chestnut trees had been destroyed, and an entire generation of Americans would never know the beauty and strength of this most beloved of trees.

Before the chestnut blight came to Alabama, the American chestnut tree dominated the upland forest canopy of northern and central Alabama. The tree once known for its rot-resistant wood and reliable nut production was reduced to sparsely scattered stump sprouts, rarely reaching over 20 feet tall. The chestnut blight, an Asiatic fungus to which the American chestnut has no resistance, had completely devastated the tree within its native range.

Luckily, volunteers in the Alabama chapter of The American Chestnut Foundation (TACF) are working hard to bring back this tree seemingly lost to posterity. As part of a national breeding program, and using pollen from blight-resistant chestnut trees at TACF's Meadowview Research Farm in Virginia, volunteers breed the extremely rare flowering American chestnut trees in Alabama called 'mother trees.' Starting with Chinese chestnut trees, which are resistant to the imported chestnut blight, researchers have made three backcrosses to American chestnut trees while selecting for blight resistance at each generation. The objective of this breeding effort is to dilute out the Chinese chestnut characteristics, while maintaining the blight resistance of the original Chinese chestnut.

The goal of the 'mother tree' breeding effort in Alabama, which is being replicated in twelve other state chapters across the eastern U.S., is to capture the genetics of locally-adapted chestnut trees before reintroduction. At this point, TACF is two tree generations from producing the trees that can be released to the wild. First, backcross seed from Alabama 'mother trees' must be grown in chapter orchards and tested for blight resistance after about five years of growth. Next, the selected backcross trees will be crossed with each other to produce what is called an intercross generation, and only the offspring with the highest levels of resistance will be selected. It will be from these trees that the seeds used for reintroduction will be harvested.

Several Alabama researchers and volunteers are working in areas of chestnut silviculture, genetics, and breeding to make chestnut reintroduction possible. One such individual is Dr. Jimmy Maddox, a specialist in plant physiology and a recent retiree from the Tennessee Valley Authority (TVA). Dr. Maddox has volunteered many hours to grow both blight-resistant hybrids and study the beneficial effects of different mycorrhizal fungi on chestnut growth at his orchard in Muscle Shoals. By growing blight-resistant hybrids at his research farm, the Alabama chapter can obtain pollen from local trees for breeding Alabama 'mother trees.'

Dennis Whiteside, a Gadsden native, has been growing American chestnut trees transplanted from the woods, and since 1998 he's been crossing them with his own Chinese chestnut trees. Starting

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Photo by Arthur Hitt

AFC Forestry Specialist Philip Horne stands beside one of the only blight-free mature American chestnut trees in the nation.

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with trees that were one-half Chinese and one-half American, Dennis has performed two generations of backcrossing and currently has trees that are only one-eighth Chinese, with the rest being Alabama American chestnut. Dennis is also a reservoir of local Alabama chestnut germplasm, including countless grafted trees and two trees transplanted to his yard, with one reaching 30 feet tall. One of his grafts produced 50 pure American chestnut seed, which were the only native Alabama chestnut seed produced in the state last year.

David Morris, president of the Alabama chapter, is leading the chapter toward its restoration goals. This Birmingham native enjoys searching out rare American chestnut trees in the wild. Together with his 92-year-old father, David found and marked fourteen American chestnut trees at his family's farm on Lacon Mountain in Morgan County. Many of these trees were over 30 feet.

David is especially looking forward to pollinating the Talladega National Forest American chestnut tree. This majestic, record-setting size tree measures over 65 feet tall and has a diameter at breast height of 14 inches. This American chestnut, like several others in eastern Alabama and Georgia, appears to have hybridized with local chinkapins. According to Dr. Fenny Dane, geneticist at Auburn University, this tree has chinkapin chloroplast DNA, which could have been inherited from a distant female ancestor, and mostly American chestnut nuclear DNA. Regardless, the tree has all chestnut characteristics, except some unusually wide leaves, and will be used in the chapter breeding program this coming year.

Under the umbrella of The American Chestnut Foundation, the Alabama chapter has joined twelve other states in a network that has a single goal – to restore the American chestnut to its native Eastern forests. With more than 5,500 members nationwide, TACF is positioned to achieve this goal with the help and encouragement not only from fellow plant breeders and geneticists, but also from "volunteer" scientists. These volunteers help stake out new breeding orchards, plant nuts or seedlings, pollinate trees, and finally, in the fall, help harvest nuts to be used in TACF's national breeding program.

Scientists are closing in on their goal of seeing the American chestnut regain its place in eastern forests, and they expect to have small quantities of blight-resistant seeds with limited availability within the next five years.

"We simply could not accomplish the amount of work that we do without these volunteers. They are the heart and soul of TACF, and with the addition of the Alabama chapter, we are excited to expand our national breeding program to another region," says Marshal Case, President and CEO of the foundation.

For more information about The American Chestnut Foundation, visit **www.acf.org.** Please contact the Alabama Chapter of the American Chestnut Foundation at **alachestnut@bellsouth.net** to find out more about local events and happenings.

About the authors . . .

David Morris is president and Wayne Boldin is secretary of the Alabama Chapter of the American Chestnut Foundation. Clint Neel is the Tennessee Chapter president.